ATTACHMENT I

Scope Of Work For Interim Measures

Purpose

If deemed necessary by Respondent and/or U.S. EPA, the purpose of Interim Measures (IM) are to control or abate immediate threats to human health and the environment and/or prevent or minimize the release or potential release of hazardous wastes or hazardous constituents at or from the Facility while long-term corrective measure alternatives are being evaluated. The Respondent shall furnish all personnel, materials and services necessary for, or incidental to, performing the IMs.

Scope

Interim Measures are one possible step in the corrective action program. Interim Measures consist of the following components, which for clarity have been designated as sections.

Section I: Interim Measures Workplan

A. Interim Measures Objectives

B. Health and Safety Plan

C. Public Involvement Plan

D. Quality Assurance Project Plan

E. Data Management and Reporting Plan

Section II: Interim Measures Design Program

A. Design Plans and Specifications

B. Operations and Maintenance Plan

C. Project Schedule

D. Final Design Documents

Section III: Interim Measures Construction Quality Assurance Plan

A. Construction Quality Assurance Objectives

B. Inspection Activities

C. Documentation

Section IV: Reports

A. Progress

B. Interim Measures Workplan

C. Final Design Documents

D. Draft Interim Measures Report

E. Final Interim Measures Report

Section V: Proposed Schedule

Section I: Interim Measures Workplan

If interim measures are proposed by the Respondent and/or determined to be necessary by U.S. EPA, Respondent shall prepare an Interim Measures Workplan. The Workplan shall include the development of several plans which shall be prepared concurrently.

A. Interim Measures Objectives

The Workplan shall specify the objectives of the interim measures, demonstrate how the interim measures will abate releases and threatened releases, and to the extent possible, be consistent and integrated with any long-term solution at the facility. The Interim Measures Workplan will include a discussion of the technical approach, engineering design, engineering plans, schedules, budget, and personnel. The Workplan will also include a description of qualifications of personnel performing or directing the interim measures, including

contractor personnel. This plan shall also document the overall management approach to the interim measures and whether a Quality Assurance Project Plan and Data Management and Reporting Plan are required for the IM.

B. Health and Safety Plan

The Respondent shall submit a Health and Safety Plan to U.S. EPA for review, although it does not require approval by U.S. EPA.

1. Major elements of the Health and Safety Plan may include:

- Facility description, including availability of resources such as roads, water supplies, electricity and telephone services;
- Description of the known hazards and evaluation of the risks associated with the incident and with each activity conducted;
- A list of key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- Description of the levels of protection to be worn by personnel;
- Delineation of the work area;
- Procedures to control site access;
- Description of decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care for injuries and toxicological problems;
- Description of requirements for an environmental surveillance program;

- Routine and special training required for response personnel; and

- Procedures for protecting workers from weather-related problems;

2. The Facility Health and Safety Plan shall be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

- U.S. EPA Order 1440.1 - Respiratory Protection;

- U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

- Facility Contingency Plan;

- U.S. EPA Standard Operating Safety Guide (1984);

- OSHA regulations particularly in 29 CFR 1910 and 1926;

- State and local regulations; and

- Other U.S. EPA guidance as provided.

3. The Health and Safety Plan shall be revised to address the activities to be performed at the facility to implement the interim measures. Respondent may use the Health and Safety Plan previously developed for use in the Release Assessment after making the necessary revisions to address the activities to be performed at the Facility to implement interim measures.

C. Public Involvement Plan

All Public Involvement Plans prepared by the Respondent shall be submitted to U.S. EPA for comment and approval prior to use. Respondents must never appear to represent or speak for the U.S. EPA before the public, other government officials, or the media.

Public Involvement activities that may be required of the Respondent include the following:

- Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;

- Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets should be reviewed by the U.S. EPA prior to public distribution);

- Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and

- Maintaining an easily accessible repository (such as a town hall or public library or the Facility itself, in some limited circumstances) of information on the facility-specific corrective action program, including the order, approved workplans, and/or other reports.

A schedule for community relations activities shall be included in the Public Involvement Plan. Respondent may use the Public Involvement Plan previously developed for use in the Release Assessment after making the necessary revisions to address the activities to be performed at the Facility to implement interim measures.

D. Quality Assurance Project Plan

Respondent shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPP shall be prepared in accordance with Attachment V. A pre-QAPP meeting shall be held prior to preparation of the QAPP.

Participants shall include, but are not limited to the Respondent, their QAPP preparer, laboratory representatives, U.S. EPA Project Coordinator, U.S. EPA Quality Assurance and Laboratory representatives.

A performance audit may be conducted by U.S. EPA on the laboratories selected by the Respondent. Respondent may use the Quality Assurance Project Plan previously developed for use in the Release Assessment after making the necessary revisions to address the activities to be performed at the Facility to implement interim measures.

E. Data Management and Reporting Plan

Respondent shall develop and initiate a Data Management and Reporting Plan to document and track interim measures data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the interim measures.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region 5 groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0.

If used, the Data Management and Reporting Plan should be consistent with the documentation and tracking described in the Scope of Work for a Release Assessment.

Section II: Interim Measures Design Program

A. Design Plans and Specifications

The Respondent shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:

- Compliance with all applicable or relevant environmental and public health standards; and

- Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

- Use of currently accepted environmental control measures and technology;

- The constructibility of the design; and

- Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. Discussion of the possible sources of error and references to possible operation and maintenance problems.

5. Detailed drawings of the proposed design including:

- Qualitative flow sheets;

- Quantitative flow sheets;

- Facility layout; and

- Utility locations.

6. Tables listing materials, equipment and specifications.

7. Tables giving material balances.

8. Appendices including:

- Sample calculations (one example presented and explained clearly for significant or unique design calculations);

- Derivation of equations essential to understanding the report; and

- Results of laboratory or field tests.

General correlations between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Respondent shall coordinate and cross-check the specifications and drawings and complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

B. Operation and Maintenance Plan

The Respondent shall prepare and Operation and Maintenance Plan to cover both implementation and long-term maintenance of the interim measure. The plan shall be composed of the following elements as appropriate to the specific interim measure:

1. Equipment start-up and operator training

The Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the treatment systems; and training covering appropriate operational procedures once the start-up has been successfully accomplished.

2. Description of normal operation and maintenance (O&M), including:

- Description of tasks for operation;

- Description of tasks for maintenance;

- Description of prescribed treatment or operation conditions;

- Schedule showing frequency of each O&M task; and

- Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing, including:

- Description of monitoring tasks;
- Description of required laboratory tests and their interpretation;
- Required QA/QC; and
- Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of equipment, including:

- Equipment identification;
- Installation of monitoring components;
- Maintenance of site equipment; and
- Replacement schedule for equipment and installed components.

5. Records and reporting mechanisms required, including:

- Daily operating logs;
- Laboratory records;
- Mechanism for reporting emergencies;
- Personnel and maintenance records; and
- Monthly/annual reports to Federal/State agencies.

The Operation and Maintenance Plan shall be submitted with the Final Design Documents or as approved in the Interim Measures Workplan.

C. Project Schedule

The Respondent shall develop a detailed Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical path tasks. Respondent shall specifically identify dates for completion of the project and major interim milestones which are enforceable terms of this order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. Final Design Documents

The Final Design Documents shall consist of the Final Design Plans and Specification (100%) complete, the final Draft Operation and Maintenance Plan, and Project Schedule. The Respondent shall submit the final documents 100% complete with reproducible drawings and specifications. The quality of the design documents should be such that the Respondent would be able to include them in a bid package and invite contractors to submit bids for the construction project.

Section III: Interim Measure Construction Quality Assurance Plan

Respondent has a set of engineering guides in standard use for the Facility construction projects which include construction quality assurance. These guides and standards may be referenced in the Construction Quality Assurance Plan as appropriate.

A. Construction Quality Assurance Objectives

In the CQA plan, the Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation. The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the interim measure should be described fully in the CQA plan. The Respondent must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the interim measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Respondent shall conduct the following activities:

1. Preconstruction inspection and meeting

The Respondent shall conduct a preconstruction inspection and meeting to:

- Review methods for documenting and reporting inspection data;
- Review methods for distributing and storing documents and reports;
- Review work area security and protocol;
- Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and
- Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion, Respondent shall notify U.S. EPA for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the U.S. EPA approved interim measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by the Respondent will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final Inspection

Upon completion of any outstanding construction items, the Respondent shall notify U.S. EPA for the purpose of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection will be used as a checklist with the final inspection focusing on the outstanding items that have been resolved.

4. Sampling and Testing Requirements

The sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems should be presented in the CQA.

C. Documentation

Reporting requirements for CQA activities shall be described in detail the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports and final

documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

Section IV: Reports

A. Progress

The Respondent shall at a minimum provide the U.S. EPA with signed, quarterly progress reports containing:

1. A description and estimate of the percentage of the interim measures completed;

2. Summaries of *all* findings;

3. Summaries of *all* changes made in the interim measures during the reporting period;

4. Summaries of *all* contacts with representatives of the local community, public interest groups, or State government during the reporting period;

5. Summaries of *all* problems of potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Interim Measures Workplan

The Respondent shall submit an Interim Measures Workplan as described in Sections I, II and III.

C. Final Design Documents

The Respondent shall submit the Final Design Documents as described in Section II.

D. Draft Interim Measures Report

At the "completion" of the construction of the project (except for long-term operations, maintenance and monitoring), the Respondent shall submit an Interim Measures and Implementation Report to U.S. EPA. The Report shall document that the project is consistent with the design specifications, and that the interim measures are performing adequately. The Report shall include, but not be limited to the following elements:

1. Synopsis of the interim measures and certification of the design and construction;

2. Explanation of any modifications to the plan and why these were necessary for the project;

3. Listing of criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also explaining any modification to these criteria;

4. Results of facility monitoring, indicating that interim measures will meet or exceed the performance criteria; and

5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

E. Final Interim Measures Report

The Respondent shall finalize the Interim Measures Work Plan and the Interim Measures Implementation Report incorporating comments received on draft submissions.

Section V: Proposed Schedule

The Respondent will provide U.S. EPA with IM submittals according to the following schedule:

Facility Submission	Due Date
Interim Measures Workplan -Interim Measures Objectives -Health and Safety Plan -Public Involvement Plan -Quality Assurance Project Plan -Data Management Plan -Construction QA Plan	Within 30 days of U.S. EPA request/determination or upon written request
Final Design Documents -Design Plans and Specs -O&M Plan -Project Schedule	As outlined in the approved workplan
Draft Interim Measures Report	In accordance with the project schedule approved in the IM Workplan
Final Interim Measures Report	30 days after receipt of U.S. EPA comments on Draft IM Report
Progress Reports	Quarterly

ATTACHMENT II

Scope of Work for a Release Assessment

Purpose

The purpose of the Release Assessment (RA) is to update the U.S. EPA Preliminary Review/Visual Site Inspection Report for the Facility dated September 1989 and to determine those areas at the facility where further investigation is necessary. Respondent reports that numerous changes have occurred at the Facility since that time and substantial remedial work has been performed, including that conducted in response to the CERCLA Section 106(a) Order issued by U.S. EPA on June 10, 1994. The RA will serve to focus the RCRA Facility Investigation (RFI) on areas, releases and exposure pathways which constitute the greatest risks or potential risks to human health and the environment. The RA shall also be used to eliminate areas from further consideration during the RFI. The RA shall make use of applicable risk-based corrective action decision-making guidance documents as allowed for under U.S. EPA, Region 5 guidance policy. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RA.

Scope

The Release Assessment is the first step in the corrective action program. The RA consists of the following components, which for clarity have been designated as sections.

Section I: Release Characterization and Screening Assessment

A. Facility Background

B. Preliminary Assessment of Nature and Extent of Contamination

C. Risk Screening Analysis

D. Implementation of Interim/Stabilization Measures

Section II: RA Workplan

A. Purpose/Objectives

B. Project Management Plan

C. Quality Assurance Project Plan

D. Data Management and Reporting Plan

E. Health and Safety Plan

Section III: Investigation Results, Analysis and Reporting

Section IV: Progress Reports

Section V: Proposed Schedule

Section I: Release Characterization and Screening Assessment

The Respondent shall submit to U.S. EPA for review and comment, a report (as set forth below) providing the background information on the Facility, existing data, an assessment of the nature and extent of contamination at the site, any risk screening procedures and analysis, and interim measures. The Respondent shall indicate in the applicable section if some of this information is not available. The report will provide background information that supplements and supports the proposed field investigations in the RA Workplan. U.S. EPA will review the report to aid in its determination of the: 1) adequacy of the existing information and data; 2) identification of additional information and data that is necessary to conduct the RA; and 3) the areas of concern and other source areas at the Facility that may require further investigation in order to meet the requirements of the Scope of Work for an RFI.

A. Facility Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Respondent's report shall include the following as appropriate to support the RA:

1. *Maps*. All maps shall be of sufficient detail and accuracy to locate and report all current and future work performed at the site. Aerial photographs may be used with areas of concern and other source areas superimposed on them. Maps shall depict the following:

- General geographic location;
- Property lines, with the owners of all adjacent property clearly indicated;
- Topography and surface drainage depicting all waterways, wetlands, flood plains, water features, drainage patterns, and surface-water containment areas;
- All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features relevant to this Order;
- All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
- All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on or after November 19, 1980;
- All known past and present product and waste underground tanks or piping;
- Surrounding land uses (residential, commercial, industrial, agricultural, recreational);
- The location of all municipal, public, private and industrial wells, along with all monitoring wells, at the Facility and within a 1-mile radius of the Facility. These wells shall be clearly labeled and ground and top of casing elevations and construction details included, if available (these elevations and details may be included as an attachment); and
- Wind rose and meteorology.

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility.

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.

4. A summary of past permits applied for and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the facility. This may include information from previous and/or present owner/operators, if available.

5. A general description of major habitat types (e.g., grasslands, forests, lakes, streams, wetlands) located in and adjacent to the facility. In delineating wetlands, the U.S. Fish and Wildlife Service's National Wetland Inventory maps should be consulted. The U.S. Army Corps of Engineers should be consulted and wetlands should be delineated using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

6. A general description of plants and animals at and adjacent to the facility, including the following: qualitative observations of resident plants and animals (birds, mammals, fish, stream benthos, etc.); and classification of vegetation community types. Threatened and endangered species possibly on or near the facility should be identified as early as possible (e.g., contact the U.S. Fish and Wildlife Service office in Reynoldsburg, Ohio at 614/469-6923 regarding the need for mussel bed surveys in the Ohio River near the facility).

B. Preliminary Assessment of Nature and Extent of Contamination

The Respondent shall prepare and submit for U.S. EPA review, a preliminary report describing the existing information on the nature and extent of contamination at the facility. The report

shall be consistent with applicable risk-based corrective action decision-making guidance documents as allowed for under U.S. EPA, Region 5 guidance policy, the Advance Notice of Proposed Rulemaking published in the *Federal Register* (61 FR 19432), U.S. EPA Soil Screening Guidance, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, appropriate land use considerations (OSWER Directive 9355.7-04), and other relevant Region 5 and National EPA documents.

1. The Respondent's report shall summarize all sources and areas of contamination at the facility. This, at a minimum, shall include all units, areas of concern, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

- Location of unit/area (to be depicted on facility map provided in Section I.A.1);
- Quantities of solid and hazardous wastes (both managed and spilled or released);
- Type of hazardous waste or constituents (both causing or potentially causing contamination), to the extent known;
- Identification of areas where additional information is necessary; and
- The results of previous investigations, including risk screening analyses, and a summary of suggested further actions for all units, areas of concern, and other source areas.
- For each medium where the exposure or potential exposure pathways identify a release of concern (e.g., soil, ground water, surface water, air, etc.), a description of the existing extent of contamination shall be performed. This description must include all available monitoring data and qualitative information on the locations and levels of contamination at the facility (both on-site and off-site). Include biodata (e.g., fishkills, distressed vegetation, abnormal

individuals of a species, carcasses, tissue studies, etc.). Include a general assessment of the data quality, a map showing the location of all existing sampling points and potential source areas and contour maps showing any existing ground water plumes at the facility. Highlight potential ongoing release areas that would warrant use of interim measures (see Section I.C. Implementation of Interim Measures); and

- A list and brief description of all previous investigations that have occurred at the facility, who they were conducted for (i.e., agency) and agency contacts.

2. The Respondent shall submit a report that identifies the potential impact(s) on human health and the environment, including potential exposure pathways, migration routes, and potential receptors for all relevant land use scenarios related to the sources of contamination identified as relevant in paragraph 1 above. A site-conceptual model should be created to illustrate these pathways, routes, and receptors. The report shall be consistent with applicable risk-based corrective action decision-making guidance documents as allowed for under U.S. EPA, Region 5 guidance policy, the Advance Notice of Proposed Rulemaking published in the *Federal Register* (61 FR 19432), U.S. EPA Soil Screening Guidance, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, appropriate land use considerations (OSWER Directive 9355.7-04), and other relevant Region 5 and National EPA documents. The report shall include, at a minimum:

- All potential migration pathways, including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, foodwebs, meteorology, air quality, chemistry, fate and transport characteristics associated with affected media, and natural attenuation, as appropriate;

- Physical properties of known contaminants;

- An assessment of whether off-site migration of contaminants has occurred or is likely to occur;

- An assessment of media-specific potential human exposure pathways (e.g., ingestion, inhalation, dermal contact), including groundwater and surface water use;

- Identification of current and future land use;

- Identification of current or potential receptors at risk including demography and identification of possible sensitive subpopulations (e.g., schools, homes for the elderly, hospitals, and ecosystems).

C. Risk Screening Analysis

The Respondent shall prepare a report detailing any screening procedures or methodologies used to eliminate exposure pathways or chemicals of concern from further consideration in the RFI and ensuing steps of the corrective action process. Exposure pathways screened out will not be considered in the RFI and may be used to justify no further data collection from those specific areas. If the RA determines, and U.S. EPA concurs, that there are no unacceptable risks to human health or the environment, either because concentrations are below applicable screening levels or there are no complete exposure pathways, an RFI would not be required.

D. Implementation of Interim Measures

The Respondent's report shall document past, present, or proposed interim measures (IMs) at the facility. This shall include:

- Objectives of the IMs: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;

- Design, construction, operation, and maintenance requirements;

- Schedules for design, construction and monitoring;
- Schedule for progress reports; and
- Data in support of the potential need for future IMs or related to any assessment undertaken to determine the need for future IMs.

Section II: RA Workplan

A. Purpose/Objectives

The Respondent shall prepare an RA Workplan. The purpose of the RA Workplan is to present to U.S. EPA the plans for focusing initial site characterizations and exposure pathways at areas of concern, spill areas, and other suspected source areas of contamination. The RA Workplan shall include the development of several plans, which shall be prepared concurrently. Upon completion of the RA, it may be necessary to prepare an RFI Workplan in order to increase the detail of information collected during the RA and meet the requirements of the Scope of Work for an RFI.

B. Project Management Plan

The Respondent shall prepare a Project Management Plan (PMP), which will include a discussion of the technical approach and schedule for implementing the RA. The schedule shall include the timeframe for initiating and completing necessary field work, and the scheduled due date for the RA Report. The PMP shall also include a description of qualifications of personnel performing or directing the RA, including contractor personnel. This plan shall also document the overall management approach to the RA.

C. Quality Assurance Project Plan

Respondent shall prepare a Quality Assurance Project Plan (QAPP) to document all monitoring procedures, sampling, field measurements and sample analyses performed during the initial investigation to characterize the specific units, areas of concern, spill areas, and other suspected source areas of contamination so as to ensure that all information, data, and

resulting decisions are technically sound, statistically valid, and properly documented. The QAPP shall be prepared in accordance with Attachment V. A pre-QAPP meeting should be held prior to preparation of the QAPP. Participants should include, but are not limited to the Respondent, their QAPP preparer, laboratory representatives, U.S. EPA Project Coordinator, and U.S. EPA Quality Assurance and Laboratory representatives.

A performance audit may be conducted by U.S. EPA on the laboratory selected by Respondent.

D. Data Management and Reporting Plan

The Respondent shall develop and initiate a Data Management and Reporting Plan (DMRP) to document and track investigation data and results. This plan shall identify and establish data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

- Unique sample or field measurement code;
- Sampling or field measurement location and sample or measurement type;
- Sampling or field measurement raw data;
- Laboratory analysis ID number;
- Property or component measured; and
- Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

- Unsorted (raw) data;

- Results for each medium or for each constituent monitored;
- Data reduction for statistical analysis;
- Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- Summary data.

3. Graphical Displays

The following data shall be presented, where appropriate, in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- Sampling location and sampling grid;
- Boundaries of sampling area, and areas where additional data are required;
- Levels of contamination at each sampling location;
- Geographical extent of contamination;
- Contamination levels, averages, and maxima;
- Changes in concentration in relation to distance from the source, time, depth or other parameters;
- Features affecting intramedia transport; and
- Potential receptors.

E. Health and Safety Plan

The Respondent shall submit a Health and Safety Plan (HSP) to U.S. EPA for review although it does not require approval by U.S. EPA. The HSP shall be developed as a stand alone document but may be submitted with the RA Workplan.

1. Major elements of the Health and Safety Plan shall include:

- Facility description including availability of resources such as roads, water supply, electricity, and telephone service;
- Description of the known hazards and evaluation of the risks associated d with each activity conducted;
- A list of key personnel and alternates responsible for site safety, response operations, and protection of human health;
- Delineation of work area;
- Description of protective clothing or other protective items to be worn by personnel in work area;
- Procedures to control site access;
- Description of decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care needed for injuries and toxicological problems;
- Description of requirements for an environmental surveillance program;
- Routine and special training required for response personnel; and
- Procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- EPA Order 1440.1 - Respiratory Protection;
- EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- Facility Contingency Plan;
- EPA Standard Operating Safety Guide (1984);
- OSHA regulations particularly in 29 CFR 1910 and 1926;
- State and local regulations; and
- Other applicable EPA guidance as provided.

Section III: Investigation Results, Analysis, and Reporting

The Respondent shall prepare an analysis and summary of all facility RA investigations undertaken in accordance with the U.S. EPA-approved RA Workplan and prepare a report on the assessment of the type and extent of contamination at or from the Facility, including sources and migration pathways. The investigation data should be sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to provide an accurate updated assessment of the specific areas of concern, spill areas, and other suspected source areas of contamination at or from the Facility that present an actual or potential threat to human health and/or the environment as identified by the exposure pathways and risk scenarios, and therefore, require further characterization pursuant to the requirements in the RFI Scope of Work.

The report shall describe the extent of contamination (qualitative/quantitative) in relation to health-based screening levels (e.g., Soil Screening Guidance (May, 1996) and final ASTM standards for risk-based corrective action as allowed for under U.S. EPA, Region 5 guidance policy). Specific areas of concern, spill areas, and other suspected source areas of contamination

identified at and/or from the Facility shall be assessed for their risk or potential risk to human health and/or the environment and recommendations made as to those areas requiring: 1) no further action; 2) further characterization under the RFI; and/or 3) interim measures.

Section IV: Progress Reports

The Respondent will, at a minimum, provide the U.S. EPA with signed quarterly progress reports containing:

1. A description and estimate of the percentage of the RA completed;

2. Summaries of *all* findings in the reporting period, including results of any sampling and analysis;

3. Summaries of *all* changes made in the RA during the reporting period;

4. Summaries of *all* contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of *all* contacts made regarding access to off-site property;

6. Summaries of *all* problems encountered during the reporting period;

7. Actions being taken to rectify problems;

8. Changes in relevant personnel during the reporting period;

9. Projected work for the next reporting period; and

10. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Section V: Proposed Schedule

The Respondent will provide U.S. EPA with RA submittals according to the following schedule:

Facility Submission	Due Date
Release Characterization and Screening Assessment (RCSA) (Section I)	Within 90 days of the effective date of this Order
RA Workplan (Section II)	Within 60 days of receipt of U.S. EPA comments on the RCSA Report
Draft RA Report (Section III)	As scheduled in the approved RA Workplan
Final RA Report	45 days after receipt of comments on the Draft RA Report
Progress Reports on Sections I through III	Quarterly

ATTACHMENT III

Scope of Work for a RCRA Facility Investigation

Purpose

The purpose of the RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents at and from the Facility that pose an actual or potential threat to human health and/or the environment as identified in the RA and to gather the necessary data to support a Corrective Measures Study (CMS), if required. Areas of concern which do not pose an unacceptable risk to human health or the environment (as determined in the RA and approved by U.S. EPA) are specifically not included in this scope of work. Areas of concern for which U.S. EPA-approved interim measures are in place or proposed are also specifically excluded from this scope of work. RFI activities may be phased (provided the timeframe for the complete RFI is reasonable) to allow for the effective uses of resources and will be consistent with applicable risk-based decision-making guidance to allow for site-specific factors in directing the course of the investigations. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI.

Scope

The RCRA Facility Investigation is the next step in the corrective action program after completion of the Release Assessment. The RFI consists of the following components, which for clarity have been designated as sections.

Section I: RFI Workplan

A. Purpose/Objectives

B. Project Management Plan

C. Quality Assurance Project Plan

D. Data Management and Reporting Plan

E. Health and Safety Plan

F. Public Involvement Plan

G. Schedule for Facility Investigation

Section II: Facility Investigation

A. Purpose/Objectives

B. Environmental Setting

C. Source Characterization

D. Contamination Characterization

E. Potential Receptor Identification

Section III: Investigation Results and Analysis

A. Data Analysis

B. Media Cleanup Standards

C. Analysis of Risk

Section IV: Progress Reports

Section V: Proposed Schedule

Section I: RFI Workplan

A. Purpose/Objectives

The Respondent shall prepare an RFI Workplan. The purpose of the RFI Workplan is to present to U.S. EPA the specific plans to further characterize the nature and extent of contamination identified during the RA as requiring further evaluation. Appropriate data collected as part of the RFI may be used in screening risk assessment evaluations consistent with applicable guidance to determine if additional investigation/data and/or further risk assessment is necessary . The RFI Workplan shall include the development of several plans, which will be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the

detail of information collected to accommodate facility-specific situations.

B. Project Management Plan

The Respondent shall prepare a Project Management Plan (PMP) which will include a discussion of the technical approach, schedules, and personnel. The PMP will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RFI.

C. Quality Assurance Project Plan

Respondent may use the Quality Assurance Project Plan previously approved by U.S. EPA for the RA provided that necessary revisions are made to address the activities to be performed during the RFI so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

A performance audit may be conducted by U.S. EPA on laboratories selected by Respondent. This audit will be completed and laboratories approved for use on the project prior to the start of field work for the RFI.

D. Data Management and Reporting Plan

Respondent may use the Data Management and Reporting Plan previously approved by U.S. EPA for the RA provided that necessary revisions are made to address the higher level of detail and higher level of activity expected for implementation of the RFI Workplan so as to ensure that investigation data and results are properly documented and tracked.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region 5 groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0.

E. Health and Safety Plan

The Respondent is required to submit a Health and Safety Plan as part of the RA. This plan may be revised as required by changing circumstances and submitted to U.S. EPA for review, although it does not require approval by U.S. EPA.

F. Public Involvement Plan

The Public Involvement Plan (PIP) prepared by the Respondent shall be submitted to U.S. EPA for comment and approval prior to use. Respondents must never appear to represent or speak for the U.S. EPA before the public, other government officials, or the media.

Public involvement activities that may be required of the Respondent include the following:

- Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;

- Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets should be reviewed by the U.S. EPA prior to public distribution);

- Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and

- Maintaining an easily accessible repository (such as a town hall or public library or the Facility itself, in some limited circumstances) of information on the facility-specific corrective action program, including the order, approved workplans, and/or other reports.

A schedule for community relations activities shall be included in the PIP.

G. Schedule for Facility Investigation

1. Sampling

2. Analysis

3. Reports

4. Public Involvement Activities

5. Laboratory or Bench-Scale Studies

Section II: Facility Investigation

A. Purpose/Objectives

The investigation phase of the RFI is the second investigatory step of the corrective action process for Respondent's Facility. Prior to this phase, the initial investigation was documented and submitted to U.S. EPA for review and approval as the Release Assessment Report. The Respondent must also have U.S. EPA approval of the RFI Workplan prior to implementing the procedures outlined therein.

Throughout the RFI implementation phase, it is critical that the Respondent comply with report submission requirements. The Respondent shall submit progress reports and a draft RFI Report for U.S. EPA review and approval. At the direction of U.S. EPA, Respondent shall develop in final format the RFI Report, which will incorporate any comments received on the draft report.

The Respondent shall conduct those additional investigations (including sampling) as approved in the RFI Workplan to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and three dimensional extent of contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptors Identification) for any areas that may present an unacceptable risk to human health or the environment as determined by the U.S. EPA-approved RA. This may be done in a tiered-approach consistent with applicable guidance documents as outlined in the RFI Workplan approved by U.S. EPA. Consistent

with applicable guidance documents, RFI data may be used in a more detailed screening analysis which may provide a basis for eliminating an area of concern from further data gathering and investigation.

The investigations shall result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative(s) during the CMS and/or IMs.

B. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility (when information already submitted to U.S. EPA is not sufficient). The U.S. EPA may request additional information not included on the following lists. This information may be collected in a tiered-fashion as outlined in the U.S. EPA-approved RFI Workplan which is reflective of site-specific conditions. Use of the risk-based corrective action process is an acceptable method to direct data gathering activities. The Respondent shall characterize the appropriate areas as approved in the RFI Workplan which may include, as appropriate, the following areas:

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

- A description of the regional and facility-specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:

  - Regional and facility-specific stratigraphy including: description of strata including strike and dip, and identification of stratigraphic contacts;

  - Structural geology including: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

- Depositional history;

- Areas and amounts of recharge and discharge;

- Influence of tidal actions on groundwater flow regimes near large rivers;

- Regional and facility-specific groundwater flow patterns; and

- Seasonal variations in the groundwater flow regime.

- An analysis of any topographic features that might influence the groundwater flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis.)

- A representative and accurate classification and description of the hydrogeologic units based on field data, tests, and cores that may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated zones), including, but not limited to:

  - Hydraulic conductivity, intrinsic permeability [particularly when non-aqueous phase liquids (NAPLs) are present], and porosity (total and effective);

  - Lithology, grain size, sorting, degree of cementation;

  - An interpretation of hydraulic interconnections between saturated zones; and

  - The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).

- Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units that may be part of the migration pathways identifying:

  - Sand and gravel in unconsolidated deposits;

  - Zones of fracturing or channeling in consolidated and unconsolidated deposits;

  - Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;

  - The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs;

  - Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation; and

  - All other geologic formations, or parts thereof, yielding a significant amount of groundwater.

- Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

  - Water level contour and/or potentiometric maps;

  - Hydrologic cross sections showing vertical flow gradients;

  - The flow system, including the vertical and horizontal components of flow; and

- Any temporal changes in hydraulic gradients, (due to tidal or seasonal influences, etc.)

- A description of man-made influences that may affect the hydrogeology of the site, identifying:

  - Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

  - Man-made hydraulic structures (sewers, pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units potentially affected by contaminant release(s). Such characterization shall include, but not be limited to, the following information:

- Where remediation by removal of soils is the only corrective measure option, provide map(s) and perpendicular cross sections showing:

  - The extent of contamination;

  - Depth of groundwater; and

  - The consistency and distribution of soils [using the Unified Soil Classification System (ASTM D 2487)];

- Where remediation by removal is the likely option, and it is necessary to determine the extent of migration (e.g., to assess the mobility of wastes from an unlined surface impoundment or landfill), provide the following in addition to the requirements immediately above:

- Depth to bedrock and the characteristics of the bedrock including discontinuities such as faults, fissures, joints, fractures, sinkholes, etc.;

- A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:

  -- USDA Textural Soil Classification and soil profiles showing stratifications or zones which may affect or direct the subsurface flow;

  -- Hydraulic conductivity and the SCS hydrologic group classification of A, B, C or D;

  -- Relative permeability (only if the waste may have changed the soil's hydraulic conductivity, such as concentrated organics);

  -- Storage capacity (if excavated soil will be stored);

  -- Shrink-swell potential (where extreme dry weather could lead to the formation of cracks);

  -- Potential for contaminant transport via erosion, using the Universal Soil Loss Equation;

  -- Soil sorptive capacity;

  -- Cation exchange capacity;

  -- Soil organic content; and

  -- Soil pH.

- The following contaminant characteristics must be included:

  -- Physical state;

  -- Viscosity;

  -- pH;

  -- pKa;

  -- Density;

  -- Water solubility;

  -- Henry's Law Constant;

  -- K_{ow};

  -- Biodegradability; and

  -- Rates of hydrolysis, photolysis and oxidation.

- Where in-situ soil treatment will likely be the remediation, the above information and the following additional information must be provided:

  - Bulk density;

  - Porosity;

  - Grain size distribution;

  - Mineral content;

  - Soil moisture profile;

  - Unsaturated hydraulic conductivity;

  - Effect of stratification on unsaturated flow; and

- Infiltration and evapotranspiration.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies likely to be affected by releases from the facility. Such characterization shall include the following activities and information:

- Description of the temporal and permanent surface water bodies including:

  - For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

  - For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

  - For rivers, streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100-year event);

  - For wetlands obtain any available delineation;

  - Containment measures in place (e.g., levees, concrete lining, etc.)

  - Drainage patterns; and

  - Evapotranspiration rates.

- Description of the chemistry of the natural surface water and sediments. This includes determining:

  - pH;

  - total dissolved solids;

  - total suspended solids;

- biological oxygen demand;
- alkalinity;
- conductivity;
- dissolved oxygen profiles;
- nutrients (NH_3, NO_3 /NO_2, PO_4^{-3});
- chemical oxygen demand;
- total organic carbon; and
- concentrations of the site-specific contaminants of concern.

• Description of sediment characteristics including:

- Deposition area;
- Thickness profile; and
- Physical parameters (e.g., grain size, density, ion exchange capacity, etc.).

4. Air

Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include:

• A description of the following parameters:

- Annual and monthly rainfall averages;
- Monthly temperature averages and extremes;
- Wind speed and direction;
- Relative humidity/dew point;
- Atmospheric pressure;

- Evaporation data;
- Development of inversions; and
- Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

- A description of topographic and man-made features that affect air flow and emission patterns, including:
  - Ridges, hills, or mountain areas;
  - Canyons or valleys;
  - Surface water bodies (e.g., rivers, lakes, etc.);
  - Wind breaks and forests; and
  - Buildings.

C. Source Characterization

With respect to source areas identified in the RA, the Respondent shall collect analytical data to characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of disposal); and any facility characteristics that may affect or have affected a release (e.g., facility security, engineered barriers). This information may be collected in a tiered-fashion as outlined in the U.S. EPA-approved RFI Workplan which is reflective of site-specific conditions. Use of the risk-based corrective action process is an acceptable method to focus and direct data gathering activities. This shall include quantification of the following specific characteristics, at each source area:

1. Area of Concern Characteristics:
   - Location of area;
   - Type of area;

- Design features;
- Operating practices (past and present) including the history of releases;
- Period of operation;
- Age of area;
- General physical conditions; and
- Method used to close or remediate the area.

2. Waste Characteristics:

- Type of waste in the area;
  - Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
  - Quantity; and
  - Chemical composition.
- Physical and chemical characteristics;
  - Physical form (solid, liquid, gas);
  - Physical description (e.g., powder, oily sludge);
  - Temperature;
  - pH;
  - General chemical class (e.g., acid, base, solvent);
  - Molecular weight;
  - Density;

- Boiling point;
- Viscosity;
- Solubility in water;
- Cohesiveness of the waste;
- Vapor pressure; and
- Flash point.

• Migration and dispersal characteristics of the waste;

- Sorption;
- Biodegradability, bioconcentration, biotransformation;
- Photodegradation rates;
- Hydrolysis rates; and
- Expected chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

D. Contamination Characterization

The Respondent shall collect analytical data on environmental media, including ground water, soils, surface water, sediment, and air as determined by the RA and approved in the RFI Workplan. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes that have been identified in the RA as having the potential for impact to human health or the environment. This information may be collected in a tiered-fashion as outlined in the U.S. EPA-approved RFI Workplan which is reflective of site-specific conditions. Use of the risk-based corrective action process is an acceptable method to focus and direct data gathering activities. Once sufficient data has been collected to rule out

an area as a source of impact to human health and the environment using acceptable risk evaluation data and potential receptors, further data gathering will not be required. Data shall include:

- time and location of sampling;
- media sampled;
- concentrations found;
- conditions during sampling; and
- the identity of the individuals performing the sampling and analysis.

The Respondent shall address the following types of contamination at the facility:

1. Groundwater Contamination

The Respondent shall conduct a groundwater investigation to characterize any plumes of contamination at the facility. If contaminants of concern are not present above applicable groundwater cleanup standards, then further investigation will not be required. This investigation shall, provide the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;
- The horizontal and vertical direction of contaminant movement;
- The velocity of contaminant movement;
- The horizontal and vertical concentration profiles of Appendix IX constituents in the plume(s);
- An evaluation of factors influencing the plume movement; and
- An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. If contaminants of concern are not present above applicable soil cleanup standards, then further investigation will not be required. The investigation shall include the following information:

- A description of the vertical and horizontal extent of contamination;
- A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;
- Site-specific contaminant concentrations;
- Velocity and direction of contaminant movement; and
- An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a surface water and sediment investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The Respondent is also required to characterize contamination from storm water runoff. If contaminants of concern are not present above applicable surface water and

sediment cleanup standards, then further investigation will not be required. The investigation shall include the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;

- The horizontal and vertical direction of contaminant movement;

- The contaminant velocity;

- An evaluation of the physical, biological, and chemical factors influencing contaminant movement;

- An extrapolation of future contaminant movement; and

- A description of the chemical and physical properties of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

The Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. If contaminants of concern are not present above applicable air cleanup standards, then further investigation will not be required. This investigation shall provide the following information:

- A description of the horizontal and vertical direction and velocity of contaminant movement;

- The rate and amount of the release; and

- The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

E. Potential Receptor Identification

The Respondent shall collect data describing the human populations and environmental systems that currently or potentially are at risk of contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be required by U.S. EPA. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:

- Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, public and industrial) and

- Location of groundwater users including wells and discharge areas.

2. Local uses and possible future uses of surface waters characterized in the "Environmental Setting" or "Contamination Characterization" Sections above:

- Domestic and municipal (e.g., potable and lawn/gardening watering);

- Recreational (e.g., swimming, fishing);

- Agricultural;

- Industrial; and

- Environmental (e.g., fish and wildlife propagation).

3. Authorized or unauthorized human use of or access to the facility and adjacent lands, including but not limited to:

- Recreation;
- Hunting;
- Residential;
- Commercial;
- Zoning; and
- Relationship between population locations and prevailing wind direction.

4. A demographic profile of the people who use or have access (authorized or unauthorized) to the facility and adjacent land, including, but not limited to: age; sex; sensitive subgroups; and environmental justice concerns.

5. A description of the ecological characteristics of the facility and adjacent areas, including habitat and species present and expected to be present. Data required for this may include the following:

- Chemical sampling in potentially exposed habitats and reference sites.
- Toxicity testing.
- Tissue analyses.
- Biological community assessment.
- Habitat assessment of aquatic and terrestrial habitats on or potentially affected by the facility.
- Revised assessment of ecological impacts on receptors. Impacts should include those occurring at individual level (e.g., mortality, growth and reproductive impairments) and those occurring at

higher levels of biological organization (i.e., at population, community, and ecosystem levels).

6. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

7. A description of any State and Federal endangered or threatened species (both proposed and listed) near the Facility.

Section III: Investigation Results and Analysis

The Respondent shall prepare an analysis and summary of all facility investigations and their results. The investigation data should be sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, to support findings of no further action, and/or to support the Corrective Measures Study and/or IMs.

A. Data Analysis

The Respondent shall analyze all facility investigation data outlined in Section III and prepare a report on the type and extent of contamination at the facility which has not been eliminated from further investigation by the screening methods used, including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area as well as in relation to applicable screening levels.

B. Media Cleanup Standards

The Respondent shall provide information as required to support U.S. EPA's selection/development for media cleanup standards (MCSs) of any releases that may have adverse effects on human health and the environment due to migration of waste constituents. MCSs are to contain such terms and provisions as necessary to protect human health and the environment, including, the provisions stated below.

1. Groundwater Cleanup Standards

The Respondent shall provide information to support U.S. EPA's selection/development of groundwater cleanup standards for all of the Appendix IX constituents found in the groundwater during the Facility Investigation (Section III). The groundwater cleanup standards shall consist of:

- For any constituents for which an MCL has been promulgated under the Safe Drinking Water Act, the MCL value;

- Background concentration of the constituent in the ground water; or

- An alternate standard [e.g., an alternate concentration limit (ACL) for a regulated unit] to be approved by U.S. EPA.

2. Soil Cleanup Standards

The Respondent shall provide information to support U.S. EPA's selection/development of soil cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the area;

- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing contaminant migration;

- The hydrologic characteristics of the area and the surrounding area, including the topography of the land around the area;

- The patterns of precipitation in the region;

- The existing quality of surface soils, including other sources of contamination and their cumulative impacts on surface soils;

- The potential for contaminant migration and impact to the underlying groundwater;

- The patterns of land use in the region;

- The potential for health risks caused by human exposure to waste constituents; and

- The potential for damage to domestic animals, wildlife, food chains, crops, vegetation, and physical structures caused by exposure to waste constituents.

3. Surface Water and Sediment Cleanup Standards

The Respondent shall provide information to support U.S. EPA's selection/development of surface water and sediment cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the area;

- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing contaminant migration;

- The hydrologic characteristics of the area and the surrounding area, including the topography of the land around the area;

- The patterns of precipitation in the region;

- The quantity, quality, and direction of groundwater flow;

- The proximity of the area to surface waters;

- The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;

- The existing quality of surface waters, including other sources of contamination and their cumulative impacts on surface waters;

- The potential for damage to domestic animals, wildlife, food chains, crops, vegetation and physical structures caused by exposure to waste constituents;

- The patterns of land use in the region; and

- The potential for health risks caused by human exposure to waste constituents.

4. Air Cleanup Standards

The Respondent shall provide information to support U.S. EPA's selection/development of air cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the area, including its potential for the emission and dispersal of gases, aerosols and particulates;

- The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;

- The operating characteristics of the area:

- The atmospheric, meteorological, and topographic characteristics of the area and the surrounding area;

- The existing quality of the air, including other sources of contamination and their cumulative impact on the air;

- The potential for health risks caused by human exposure to waste constituents; and

- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

5. Other Relevant Cleanup Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally approved state water quality standards, water quality criteria, health advisories, proposed MCL's, etc.).

C. Analysis of Risk

Respondent may determine as necessary, or U.S. EPA may require, an analysis of risk at the facility. This analysis would include ecological as well as human health risk and shall be consistent with applicable guidance. Risk may be evaluated at several milestones within the process, as developed in the U.S. EPA-approved RFI Workplan.

All activities in conducting corrective action pursuant to this Order will allow for risk screening steps to be conducted with the data available at the risk assessment phase as well as within the RFI and CMS as appropriate. Generally, a screening risk assessment would be conducted during the RA with additional, more detailed analysis, including appropriate cumulative risk, occurring during the RFI as more data becomes available. The highest level of risk analysis may occur later in the CMS stage.

Section IV: Progress Reports

The Respondent will, at a minimum, provide the U.S. EPA with signed quarterly progress reports. These reports are required to contain the following information, but U.S. EPA requirements are not limited to this list:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of *all* findings in the reporting period, including results of any sampling and analysis;

3. Summaries of *all* changes made in the RFI during the reporting period;

4. Summaries of *all* contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of *all* contacts made regarding access to off-site property;

6. Summaries of *all* problems encountered during the reporting period;

7. Actions being taken to rectify problems;

8. Changes in relevant personnel during the reporting period;

9. Projected work for the next reporting period; and

10. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Section V: Proposed Schedule

The Respondent will provide U.S. EPA with RFI submittals according to the following schedule:

Facility Submission	Due Date
RFI Workplan (Section I)	60 days after receipt of U.S. EPA approval of the RA Report
Draft RFI Report (Sections II and III)	As scheduled in the approved RFI Workplan
Final RFI Report	45 days after receipt of comments on the Draft RFI Report
Progress Reports on Sections I through III	Quarterly

ATTACHMENT IV

Scope of Work for a Corrective Measures Study

Purpose

If deemed necessary by U.S. EPA, the purpose of the Corrective Measures Study (CMS) portion of the RCRA corrective action process is to identify and evaluate potential remedial alternatives for the releases that have been identified at and/or from the Facility.

Scope

A Corrective Measures Study Report is, unless otherwise specified by U.S. EPA, a required element of the CMS. The CMS consists of the following components:

Section I: Corrective Measures Study Report

A. Introduction/Purpose

B. Description of Current Conditions

C. Media Cleanup Standards

D. Identification, Screening and Development of Corrective Measure Alternatives

E. Evaluation of A Final Corrective Measure Alternative

F. Recommendation by Respondent for a Final Corrective Measure Alternative

G. Public Involvement Plan

Section II: Progress Reports

Section III: Proposed Schedule

Section I: Corrective Measures Study Report

The CMS Report shall include the following elements:

A. Introduction/Purpose

The Respondent shall describe the purpose of the document and provide a summary description of the project.

B. Description of Current Conditions

The Respondent shall include a brief summary/discussion of any new information that has been discovered since the initial report was provided as part of the RA Workplan. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s).

C. Media Cleanup Standards

The Respondent may propose media cleanup standards. The standards must be based on promulgated Federal and State standards, risk derived standards, all data and information gathered during the corrective action process (e.g., from interim measures, RCRA Facility Investigation, etc.), and/or other applicable guidance documents. If no other guidance exists for a given contaminant and media, the Respondent shall propose and justify a media cleanup standard.

D. Identification, Screening, and Development of Corrective Measure Alternatives

1. Identification: List and briefly describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. The Respondent should consider including a table that summarizes the available technologies. Depending on the site-specific situation, U.S. EPA may require the Respondent to consider additional technologies.

The Respondent should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure

technologies. Innovative technologies are defined as those technologies utilized for remediation other than incineration, solidification/stabilization, and pumping with conventional treatment for contaminated groundwater. Innovative treatment technologies may require extra effort to gather information, to analyze options, and to adapt the technology to the site-specific situation. Treatability studies and on-site pilot scale studies may be necessary for evaluating innovative treatment technologies. Passive technologies may also be considered based on risk and transport evaluations performed during the RFI.

2. Screening: When the Respondent is required to, or chooses to, evaluate a number of corrective measures technologies, the Respondent will evaluate the technology limitations to show why certain corrective measures technologies may prove unfeasible to implement given existing waste and site-specific conditions.

Likewise, if only one corrective measure alternative is being analyzed, the Respondent must indicate any technological limitations given waste and site-specific conditions at the facility for which it is being considered. The Respondent should consider including a table that summarizes these findings.

3. Corrective Measure Development: As required by U.S. EPA, the Respondent shall assemble the technologies that pass the screening step into specific alternatives that have potential to meet the corrective action objectives for each media. Options for addressing less complex sites could be relatively straight-forward and may only require evaluation of a single or limited number of alternatives.

Each alternative may consist of an individual technology or a combination of technologies used in sequence (i.e., treatment train). Depending on the site-specific situation, different alternatives may be considered for separate areas of the facility. List and briefly describe each corrective measure alternative.

E. Evaluation of a Final Corrective Measure Alternative

For each remedy which warrants a more detailed evaluation, including those situations when only one remedy is being proposed, the Respondent shall provide detailed documentation of how the potential remedy will comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The specific standards are provided below.

1. Protect human health and the environment.

2. Attain media cleanup standards set by the U.S. EPA.

3. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.

4. Comply with any applicable standards for management of wastes.

5. Other Factors.

In evaluating the selected alternative or alternatives the Respondent shall prepare and submit information that documents that the specific remedy will meet the standards listed above. The following guidance should be used in completing this evaluation. This guidance provides examples of the types of information that would be supportive; U.S. EPA may require additional information.

1. Protect Human Health and the Environment

Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Another example would be a requirement for the construction of

barriers or for other controls to prevent harm arising from direct contact with waste management units. Therefore, the Respondent shall include a discussion on what types of short term remedies are appropriate for the particular facility in order to meet this standard. This information should be provided in addition to a discussion of how the other corrective measure alternatives meet this standard.

2. Attain Media Cleanup Standards Set by U.S. EPA

Remedies will be required to attain media cleanup standards set by U.S. EPA which may be derived from existing state or federal regulations (e.g. groundwater standards) or other standards. The media cleanup standards for a remedy will often play a large role in determining the extent of and technical approaches to the remedy. In some cases, certain technical aspects of the remedy, such as the practical capabilities of remedial technologies, may influence to some degree the media cleanup standards that are established.

As part of the necessary information for satisfying this requirement, the Respondent shall address whether the potential remedy will achieve the preliminary remediation objective as identified by U.S. EPA as well as other, alternative remediation objectives that may be proposed by the Respondent. The Respondent shall also include an estimate of the time frame necessary for each alternative to meet these standards.

3. Control the Sources of Releases

A critical objective of any remedy must be to stop further environmental degradation by controlling or eliminating further releases that may pose a threat to human health and the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will essentially involve a perpetual cleanup. Therefore, an effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective action program.

The source control standard is not intended to mandate a specific remedy or class of remedies. Instead, the Respondent is encouraged to examine a wide range of options. This standard should not be interpreted to preclude the equal consideration of using other protective remedies to control the source, such as partial waste removal, capping, slurry walls, in-situ treatment/stabilization and consolidation.

As part of the CMS Report, the Respondent shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at the facility and the known track record of the specific technology.

4. Comply With Any Applicable Standards for Management of Wastes.

The Respondent shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable state or federal regulations (e.g., closure requirements, land disposal restrictions).

5. Other Factors

There are five general factors that will be considered as appropriate by U.S. EPA in selecting/approving a remedy that meets the four standards listed above. These factors represent a combination of technical measures and management controls for addressing the environmental problems at the facility. The five general decision factors include:

a. Long-term reliability and effectiveness;

b. Reduction in the toxicity, mobility or volume of wastes;

c. Short-term effectiveness;

d. Implementability; and

e. Cost.

U.S. EPA may request the Respondent to provide additional information to support the use of these factors in the evaluation of viable remedial alternatives. Examples of the types of information that may be requested are provided below:

a. Long-term Reliability and Effectiveness

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. The Respondent may consider whether the technology or a combination of technologies have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have an immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, flooding, earthquakes, etc.).

Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure alternative should be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

b. Reduction in the Toxicity, Mobility or Volume of Wastes

As a general goal, remedies will be preferred that employ techniques, such as treatment technologies, that are capable of eliminating or substantially reducing the inherent potential for the wastes in

SWMUs (and/or contaminated media at the facility) to cause future environmental releases or other risks to human health and the environment. There may be some situations where achieving substantial reductions in toxicity, mobility or volume may not be practical or even desirable. Examples might include large, municipal-type landfills, or wastes such as unexploded munitions that would be extremely dangerous to handle, and for which the short-term risks of treatment outweigh potential long-term benefits.

Estimates of how much the corrective measures alternatives will reduce the waste toxicity, volume, and/or mobility may be helpful in applying this factor. This may be done through a comparison of initial site conditions to expected post-corrective measure conditions.

c. Short-term Effectiveness

Short-term effectiveness may be particularly relevant when remedial activities will be conducted in densely populated areas, or where waste characteristics are such that risks to workers or to the environment are high and special protective measures are needed. Possible factors to consider include fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation, and redisposal or containment of waste material.

d. Implementability

Implementability will often be a determining variable in shaping remedies. Some technologies will require state or local approvals prior to construction, which may increase the time necessary to implement the remedy. In some cases, state or local restrictions or concerns may necessitate eliminating or deferring certain technologies or remedial approaches from

consideration in remedy selection. Information to consider when assessing implementability may include:

1. The administrative activities needed to implement the corrective measure alternative (e.g., permits, rights of way, off-site approvals, etc.) and the length of time these activities will take;

2. The constructibility, time for implementation, and time for beneficial results;

3. The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and

4. The availability of prospective technologies for each corrective measure alternative.

e. Cost

The relative cost of a remedy may be an appropriate consideration, especially in those situations where several different technical alternatives to remediation will offer equivalent protection of human health and the environment, but may vary widely in cost. However, in those situations where only one remedy is being proposed, the issue of cost would not need to be considered. Cost estimates could include costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance, etc.

F. Recommendation by Respondent for a Final Corrective Measure Alternative

In the CMS Report, the Respondent may recommend a preferred remedial alternative for consideration by U.S. EPA. Such a recommendation should include a description and supporting

rationale for the proposed remedy, consistent with the remedial standards and the decision factors discussed above. Such a recommendation is not required and the U.S. EPA still retains the role of remedy selection.

G. Public Involvement Plan

After the CMS has been performed by the Respondent and the U.S. EPA has selected a preferred alternative for proposal in the Statement of Basis, it is the agency's policy to request public comment on the Administrative Record and the proposed corrective measure(s). Changes to the proposed corrective measure(s) may be made after consideration of public comment. U.S. EPA may also require that the Respondent perform additional corrective measures studies. If the public is interested, a public meeting may be held. After consideration of the public's comments on the proposed corrective measure, the agency develops the Final Decision and Response to Comments to document the selected corrective measure, the agency's justification for such selection, and the response to the public's comment. Additional public involvement activities may be necessary, based on site-specific circumstances.

Section II: Progress Reports

The Respondent will, at a minimum, provide U.S. EPA with signed quarterly progress reports. These reports are required to contain the following information, but U.S. EPA requirements are not limited to this list:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of *all* findings in the reporting period, including results of any pilot studies;

3. Summaries of *all* changes made in the CMS during the reporting period;

4. Summaries of *all* contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of *all* contacts made regarding access to off-site property;

6. Summaries of *all* problems encountered during the reporting period;

7. Actions being taken to rectify problems;

8. Changes in relevant personnel during the reporting period;

9. Projected work for the next reporting period; and

10. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Section III: Proposed Schedule

The Respondent will provide the U.S. EPA with CMS submittals according to the following schedule:

Facility Submission	Due Date
Draft CMS Report (Section I)	Within 60 days of U.S. EPA approval of the RFI Report
Final CMS Report (Section I)	45 days after Public and U.S. EPA Comments on the Draft Final CMS
Progress Reports on Sections I	Quarterly

ATTACHMENT V

Region 5
Model RCRA Quality Assurance Project Plan (QAPP)

The following model document has been prepared by U.S. EPA Region 5 to facilitate preparation of a QAPP based on U.S. EPA Quality Assurance Management Staff and Region 5 requirements. This model is intended to serve as a tool for the production of approvable QAPPs for a wide variety of RCRA investigations.

How to use this document

This document describes the preparation of a QAPP in a series of elements. Each element contains two types of information:

1) Content Requirements (presented as smaller text characters): The first pages of each QAPP element contain requirements which must be described in that QAPP section in order to receive Region 5 approval.

2) Structural Guidance (presented as larger text characters and headed by appropriate section number): This example language is intended to be guidance to show to the QAPP preparer the level of detail that is typically needed to gain Region 5 approval. This example language will appear as follows:

a) Portions of the Model QAPP which are example language are indicated in regular print. During preparation of a facility-specific QAPP, these portions should, of course, be deleted and replaced with the pertinent information for your site.

b) Alternative language specific to RCRA sites, and general notes, are indicated in **bold print.**

c) Some of the example language in this QAPP is applicable to a broad range of sites, and may be considered "boiler-plate". "Boiler-plate" language is indicated by a dark background, such as you see here. The "boiler-plate" language should be of wide-ranging applicability, and has been pre-approved by the Region 5 QAS.

DOs AND DON'Ts TO FACILITATE QAPP APPROVAL

1. **DO NOT** submit the laboratory quality assurance program plan attached in an appendix in order to satisfy project-specific quality assurance project plan (QAPP) information. The generic lab QAPPs contain extraneous and ambiguous tables and information.

   DO append or otherwise incorporate into the QAPP the laboratory information that is project-specific (e.g. laboratory chain of custody, internal performance and system audits, etc.) to address certain elements outlined in this document.

2. **DO NOT** reproduce tables containing key information such as types of samples, numbers of investigational and quality control samples per matrix, or lists of target compounds. There should be one table of each kind of information contained in the QAPP.

   DO provide section-specific references when referring to the tabular information in the QAPP, Field Sampling Plan, or RFI Workplan. By doing so, errors caused by not changing duplicated or summarized tables will be minimized.

3. **DO NOT** submit photocopied pages from Test Methods For Evaluating Solid Waste (SW-846) as laboratory SOPs. If, for any reason, there is a need to refer to SW-846, specific references to it may be made.

   DO submit laboratory-specific SOPs for review.

4. **DO NOT** submit copies of manufacturer's guides to operating certain instrumentation such as the field equipment commonly used to detect volatile organic analytes, or for the measurement of pH, Eh, and specific conductance. The U.S. EPA evaluates the operator's standard operating procedure for calibrating and maintaining such instruments.

5. **DO NOT** submit a multiple choice list indicating which methods will be used to analyze certain hazardous constituents. Only the instrumental and preparatory/cleanup/extraction/digestion procedures that will actually be utilized for analysis must be indicated in the QAPP. If SW-846 offers a selection of possibilities for performing the analyses, then the QAPP must specify which methods will actually be used.

6. **DO NOT** submit a QAPP to the U.S. EPA for review until a laboratory has been selected by the facility for completing all work. Once a selection has been made, laboratories cannot be changed due to a possible lab audit by U.S. EPA.

7. **DO NOT** write the QAPP until a pre-QAPP meeting has been held. This meeting involves representatives of the laboratory, the facility, and the U.S. EPA for the purpose of defining project objectives and evaluating potential QA problems during implementation of the workplan.

8. **DO** provide in the QAPP the complete list of hazardous constituents to be measured and reported for the facility project. Such lists will be consistent with those constituent lists for which the methods have been validated.

9. **DO** provide information on sample tags. Sample tags are required for all samples taken in the field, as part of the chain of custody procedure.

10. **DO** provide a data deliverables package which will reflect a "CLP-like deliverables" format (the CLP forms are not required but the same information must be supplied).

11. **DO** provide for a data validation process which will validate 100% of the data by a party independent of the laboratory generating such data. This validation will be performed prior to transmittal to the U.S. EPA. All data must be made available to the U.S. EPA immediately upon request.

12. **DO** provide copies of the draft QAPP and revisions to the appropriate laboratory personnel in order to ensure the laboratory can meet the requirements of the QAPP.

13. **DO NOT** submit the entire QAPP document **upon resubmittal**.

    DO submit only those pages which were revised from the previous submittal.